

Lightweight Concrete Block

The Problem

A regular concrete block (also called a *concrete masonry unit*, or CMU) can weigh up to 50 pounds, depending on size. For masons and mason tenders, lifting and placing CMUs can cause fatigue and put strain on the low back, hands, and arms. If you do this work often, you may be at risk of a serious muscle or joint injury.

The risk depends on how many units you handle, how heavy they are, how often you work with them, how low they are stored, and how high you have to reach to place them on the course. You have even more risk if you twist your body when lifting or holding CMUs, or if you lift or hold them with one hand.

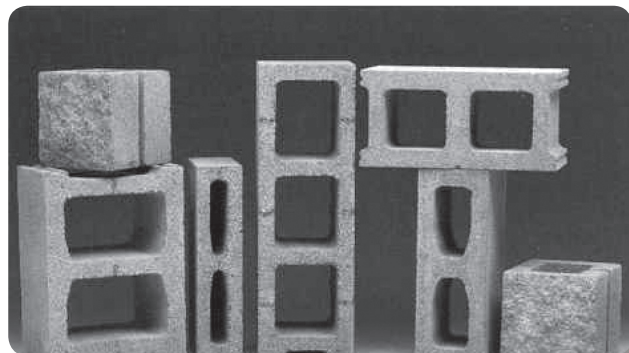
Problem: Laying standard concrete block



One Solution

Use **lightweight concrete block**. Units weigh 30-40% less than regular block without sacrificing strength or performance. Working with lightweight block can improve your output during the day and still decrease the total weight you lift. Less weight means you will be less tired and there will be less stress on your back, hands, and arms.

Solution: Types of lightweight block



How It Works

The aggregate used for lightweight block is made from shale, clay, and/or slate. These materials are expanded in a rotary kiln at temperatures over 1000° C.

The block is structurally strong, stable, and durable, yet also light in weight and a good insulator. The block density is only 40–50 pounds per cubic foot. An ordinary block made from rock and sand has a density of 105–115 pounds per cubic foot. Lightweight block meets or exceeds the specifications required of regular heavy concrete block (American Society for Testing and Materials (ASTM) C 90 Standards Specifications for Load-bearing Concrete Masonry Units).

Benefits for the Worker and Employer

Laying lightweight CMUs reduces a worker’s fatigue and lowers stress on the back and arm muscles. One study looked at how concrete block of different weights affects muscle stress. Masons built two walls. One used lightweight CMUs and the other regular CMUs. When workers built the lightweight CMU wall, they had less back and arm muscle stress. The difference was greatest when lifting the block to the top of high walls.

There can also be a gain in productivity. According to the National Concrete Masonry Association (NCMA), “lighter weight units resulted in higher productivity rates (other factors being equal).”

Approximate Cost

Lightweight block costs slightly more per unit than standard block. However, since masons and mason tenders can work faster and better, there should be a reduction in labor cost. This can account for up to 80% of the finished wall cost. Shipping and handling costs may be lower as well.

For More Information

- Products related to this solution are described at www.cpwr.com/simple.html. Products also may be found on the internet using the following search terms: lightweight “concrete (or) masonry (or) block.”
- Local contractor tool and equipment suppliers or rental companies may be another source of information on products.
- For general information on this solution, check www.cpwrconstructionsolutions.org and www.elcosh.org. The Expanded Shale, Clay, and Slate Institute (ESCSI) in Salt Lake City, UT also has more information at www.escsi.org.